

**COMPARATIVE STUDY OF THE PATHOGENICITY
AND PATHOGENESIS OF A LOCAL NIGERIAN
VELOGENIC NEWCASTLE DISEASE VIRUS IN
GUINEA FOWLS AND CHICKENS**

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AND MICROBIOLOGY
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**A DISSERTATION SUBMITTED TO THE DEPARTMENT OF
VETERINARY PATHOLOGY AND MICROBIOLOGY
UNIVERSITY OF NIGERIA, NSUKKA
IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD
OF MASTER OF SCIENCE (M.Sc.) IN VETERINARY PATHOLOGY**

December, 2008

DECLARATION

I hereby declare that the work described in this dissertation was carried out by me in the Pathology laboratory of Pathology and Microbiology Department, University of Nigeria, Nsukka under the supervision of Professor J.O.A. Okoye.

This dissertation is the result of my own work and includes nothing which is the outcome of the work in collaboration. The work of other investigations is duly acknowledged and referred to in the text.

The dissertation has not been submitted in part or in full to any other University for a degree or diploma.

CERTIFICATION

IGWE, Amarachukwu Olejieme, a postgraduate student in the Department of Veterinary Pathology and Microbiology and with the Registration Number **PG/M.Sc./05/39703** has satisfactorily completed the requirements for course and research work for the degree of Master of Science in Veterinary Pathology. The work embodied in this dissertation is original and has not been submitted in part or full for any other diploma or degree of this or any other university.

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DEDICATION

This work is dedicated to my late Dad, Chief Godfrey Igwe Okoroafor and my Mum, Mrs Flora Igwe Okoroafor. Also to poultry farmers worldwide especially in Nigeria who have at one time suffered the economic effects of Newcastle disease.

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Abstract

The susceptibility, clinical signs, lesions, distribution and persistence of a local Nigerian Velogenic Newcastle disease virus KUDU-113 were studied in experimental infection in 6-week-old guinea fowls and chickens. Following inoculation intramuscularly, severe depression, whitish-green diarrhea, lethargy, hunched posture, tremors and torticollis were observed in infected chickens from day 3 PI. In infected guinea fowls depression, greenish diarrhea, dehydration, paralysis, torticollis and droopy wings were consistent clinical features. Morbidity was 100% and 91% in chickens and guinea fowls respectively, while the total mortality was 94.6% and 22.2% in chickens and guinea fowls respectively. Weight loss was highly significant in both infected groups ($P < 0.05$). Post-mortem examination showed atrophy of the lymphoid organs (thymus, bursa of Fabricius and spleen) and congestion of kidneys in inoculated groups. Hemorrhages on the mucosa of proventricular glands, sharply-demarcated hemorrhagic ulcers in the intestine and in the caecal tonsils were observed only in infected chickens. Congestion in the brain vessels was always present in the infected guinea fowls. Histopathologically, endotheliosis, neuronophagia in the brain, atrophy of the lymphoid organs due to necrosis and depletion of lymphocytes, and ballooning degeneration in bursal follicles were observed in infected chickens and guinea fowls. The highest antibody titers recorded on day 15 PI were considerably higher in infected chickens than that of the infected guinea fowls. On day 6 PI virus distribution was widespread and virus was detected in several organs including cloacal swabs. On days 15 and 19 PI there was anaemia in chickens. Leukocytosis, heterophilia and lymphopenia were common on days 3 to 15 in inoculated groups. Consequently, susceptibility to highly virulent NDV was shown to vary among chickens and guinea fowls. However, in general, disease among guinea fowls was less severe, despite the virus distribution in its several organs (bursa of Fabricius, thymus, spleen, brain and trachea/lungs), than in chickens. Intramuscular inoculat

ion test showed high mortality in chickens with intestinal ulcers and hemorrhagic lesions which indicated that the KUDU-113 NDV strain is a velogenic viscerotropic virus.

Key words: velogenic Newcastle disease virus; experimental infection; susceptibility; Guinea fowls; cockerels; Nigeria.